DEPARTMENT OF HEALTH AND HUMAN SERVICES

Statement by

Dr. Judith L. Vaitukaitis
Director, National Center for Research Resources
National Institutes of Health

on
Fiscal Year 2001 President's Budget Request
for the National Center for Research Resources

Mr. Chairman and Members of the Committee:

I am pleased to present the President's non-AIDS budget request for the National Center for Research Resources (NCRR) for Fiscal Year 2001, a sum of $602.7 million which reflects an increase of $33.6 million over the FiscalYear 2000 appropriation. Including the estimated allocation for AIDS, total support requested for NCRR is $714.2 million, an increase of $39.1 million over the Fiscal Year 2000 appropriation. Funds for the NCRR efforts in AIDS research are included within the Office of AIDS Research.

It is a pleasure once again to have the opportunity to present the accomplishments of NCRR-supported investigators and future directions for NCRR programs. Before the recent turn of the millennium, doomsayers predicted the end of the world as we know it, and in some respects they were right. Advances in computer technology, bioengineering, imaging technologies, neuroscience and genomics will revolutionize biomedical research in the 21st century. The NCRR mission is unique among the NIH institutes and centers. While the other NIH components focus on particular diseases, organ systems, or categories of research, NCRR alone has a trans-NIH mandate--to develop and maintain the research infrastructure that enables all lines of biomedical inquiry. This effort transcends both clinical and basic research. NCRR's nationwide networks for basic and clinical research discern the molecular causes of disease, develop new preventive strategies, and assess novel therapies

for diseases that affect majority as well as minority populations across this Nation. By providing scientists access to advanced technologies and sophisticated research facilities for collaborative clinical and basic research, NCRR serves as a facilitator--or catalyst--for biomedical discovery.

One of NCRR=s main objectives is to utilize scarce or expensive resources to the fullest by sharing them among many investigators. This strategy is efficient and cost effective. Each year more than 20,000 investigators, supported by more than $2.5 billion in competitive grant support from the other NIH components, use NCRR-supported research resources. To meet the needs of biomedical investigators for access to costly technologies, NCRR collaborates with the Department of Energy and the National Science Foundation (NSF) to provide access for biomedical investigators to high-energy x-rays at the synchrotron facilities operated by those two agencies. In addition, NCRR provides access to advanced computing for health-related research by partnering with the NSF-supported San Diego Supercomputer Center, one of the two National Partnerships for Advanced Computational Infrastructure currently supported by the NSF.

NCRR-funded resources have been critical to numerous projects that advance biomedical science. Many NCRR-supported discoveries have immediate benefits for patients; others help basic research move forward toward this ultimate goal. For example, separate groups of scientists, using NCRR-supported beamlines for x-ray crystallography, have determined the three-dimensional structure of ribosomes--our cells= protein factories--in unprecedented detail. These studies may expedite discovery of newer, more effective antibiotics. Animal studies conducted at an NCRR-supported primate center have shown that it is possible, by gene therapy, to reverse the brain cell destruction that is characteristic of Alzheimer’s disease; and NCRR-supported clinical investigators have developed methods to assess changes in particular areas of the brain of depressed patients. The identification of these specific brain areas is fundamental to designing improved treatments for depression.

According to the National Institute of Mental Health, depression affects more than 19 million American adults and costs society more than $30 billion in 1990.

BIOENGINEERING, COMPUTERS, AND ADVANCED INSTRUMENTATION

The ongoing technological revolution has made it abundantly clear that biomedical science is no longer the sole province of physicians, biochemists, and biologists. Engineers, physicists, and computer scientists are essential partners for developing and adapting new instruments and technologies for health-related research. For example, improved imaging systems are needed to investigate the pathophysiology of human disease by studying patients as well as small animals and nonhuman primates as disease models. To obtain the same resolution as in humans, these imaging systems must have sensitivities that are up to 2,500 fold greater. NCRR proposes to support further technological development of high resolution imaging tools that include computed tomography, magnetic resonance imaging (MRI), and positron emission tomography.

Functional MRI imaging has provided investigators a powerful technology for studies of the human brain and has contributed significantly with other complementary technologies to a virtual revolution in neuroscience research. To further take advantage of these imaging and related technologies, NCRR proposes to support the establishment of regional MRI imaging resource centers where experts in developing and using functional MRI can work with neuroscientists to study brain disorders and also explore novel therapies, including stem cell therapy to arrest, reverse, or even cure neurodegenerative diseases. NCRR plans to functionally link those NCRR-supported Biomedical Technology Research Resource Centers equipped with sophisticated imaging capabilities with General Clinical Research Centers at the same host institution in order to accommodate patients from across this country for studies of neurodegenerative and other brain disorders, supported by NIH categoric institutes.

The use of high-level computers and advanced computer programs are essential components of today's biomedical research, but many biomedical scientists are not sufficiently familiar with bioinformatics, a key enabling technology. To help alleviate this urgent need, NCRR proposes to establish bioinformatics centers that will advance research in particular areas of biomedical investigation, as part of the Biomedical Information Science and Technology Initiative (BISTI). Those centers will create homes for interdisciplinary teams that will establish nurturing environments for exploration and research. Biomedical investigators are generating data in profuse quantities. For example, a single biomedical laboratory can produce up to 100 terabytes of information a year--about the same as the information in one million encyclopedias. In order to be useful, the data must be indexed and stored, analyzed and abstracted. To facilitate analysis of this data, NCRR proposes to establish another program that will foster development of tools to design future studies.

Synchrotron resources--which produce the high-energy x-rays used for determining the 3-D structures of molecules--have an enormous impact on structural biology and drug design. The number of NIH users at NCRR-supported synchrotron beamlines doubled between 1995 and 1997, and requests for access to these facilities are increasing at an exponential rate. NCRR proposes to alleviate the projected substantial shortfall for access to beamtime by adding more technical staff so that technical support is available around the clock. New beamlines at the Advanced Photon Source at the Argonne National Laboratory may allow investigators to address more advanced structural biology grand challenges. In addition, several new beamlines must be built at the Advanced Light Source at the Lawrence Berkeley National Laboratory and designed for high throughput studies of less complex structures to meet the anticipated high volume of need for this approach. This effort will combine new developments in beamline design, x-ray detectors, cryocrystallography, robotics, and computational software.

GENETIC MEDICINE

Manifestations of gene action are explored through phenotypic assessment of genetically altered animals and biologic characterization of macromolecules expressed by both normal and altered genes. NCRR proposes to support regionally-linked resource centers for phenotypic studies of genetically altered research animal models. These resource centers will provide a critical infrastructure for analysis of gene function in animal models of human diseases. NCRR must provide those regional resources and several other biorepositories for genetically altered biologic collections and additional funding for more technical staff to help maintain the rapidly expanding biologic collections. Additional staffing is also needed to curate and standardize the genetic databases for those important research models--including flies, fish, and worms. Without continuous updating and editing, databases quickly become useless and as a result, unnecessary duplication of research results.

HEALTH DISPARITIES

NCRR proposes to help alleviate health disparities for several diseases that disproportionately affect minority populations by competitively establishing several Comprehensive Centers on Health Disparities (CCHD). Those centers are to be hosted by medical schools located at universities that have an NCRR-supported Research Centers in Minority Institutions (RCMI) facility for clinical research. The NCRR CCHD initiative will focus on diabetes, AIDS, and infant mortality, but initially will place increased emphasis on cancer screening and management of cardiovascular disease and stroke. This effort will be in partnership with appropriate categoric NIH institutes and with nearby General Clinical Research Centers.

RESEARCH CAPACITY

NCRR proposes to continue support for construction or renovation of biomedical research facilities to assure that state-of-the-art research laboratories are available to conduct the most sophisticated research. According to a 1998 National Science Foundation survey, at least 65 percent of biomedical research laboratories are inadequate to host sophisticated research. Grant awards for construction or renovation through NCRR's Research Facilities Improvement program are not intended to be the major source for institutional funding of research laboratory construction or renovation.

NCRR proposes to expand its Animal Facility Improvement program to meet institutions' needs nationally to upgrade animal research facilities to perform genetic research with rodents, nonhuman primates and other animal models. To assist research-performing Historically Black Colleges and Universities and other minority-serving institutions in bringing their animal research facilities up to AAALAC standards, NCRR proposes a special initiative to address this problem.

CAREER DEVELOPMENT

Over the past several years, fewer young physicians have pursued research careers. To help address that problem, NCRR has initiated programs to increase the number of young physicians in the clinical research pipeline. NCRR proposes to extend that effort in FY 2001. That effort includes expanded support for a year-long medical student mentored clinical research training program. The intent of this program is to serve as a catalyst for young physicians to pursue careers in patient-oriented research. The institutional GCRC or the RCMI-funded Clinical Research Center will serve as a focal point for patient-oriented research, through mentored didactic training and "hands-on" research. This new program will support up to 90 students per year. NCRR also proposes to increase the number of Mentored Patient-Oriented Research Career Development Awards to physicians and

dentists at GCRC sites. This very successful program was formerly known as the Clinical Associate Physician (CAP) program.

A serious shortage exists of trained veterinary pathologists to meet the collaborative research needs of scientists to assess the phenotypic manifestations of genetically altered animal models of human disease. To enhance the pipeline, NCRR proposes to initiate a one-year program for veterinary students that will provide a mentored biomedical research experience at research-intensive institutions. In addition, NCRR proposes to increase the number of Special Emphasis Research Career Award to train veterinarians in health-related research as pathobiologists. The NCRR programs are intended to address the inadequate number of research-trained veterinarians who participate in biomedical research.

The NIH budget request includes the performance information required by the Government Performance and Results Act (GPRA) of 1993. Prominent in the performance data is NIH's first performance report which compares our FY 1999 results to the goals in our FY 1999 performance plan. As our performance measures mature and performance trends emerge, the GPRA data will serve as indicators to support the identification of strategies and objectives to continuously improve programs across the NIH and the Department.

My colleagues and I will be happy to respond to any questions you may have.